Invited Papers

7. Superconductivity. DAVID H. DOUGLASS, JR., *University of Chicago.*

One of the experimental techniques which has given detailed and complete information on the superconducting energy gap is electron tunneling between two metallic films separated by a thin insulating layer. Measurements of the current and differential conductance as a function of applied voltage yield accurate values of the energy gap, the density of the quasiparticle state, the dependence of these quantities on various parameters, and in general a great deal of information on the microscopic properties of the superconducting state.

8. A New Highly Sensitive Quartz Fiber Electrometer. FRANCIS SHONKA, *St. Procopius College.*

This paper describes an electrometer based on a new principle of operation for the measurement of DC voltages. A movable conducting quartz fiber is situated between two fixed electrodes (binants). When ac voltages, 180° out of phase, are applied to the binants, the fiber (at zero potential) will oscillate at double the applied AC frequency. The ac voltages can be adjusted so that the fiber will be in stationary equilibrium at its mechanical rest position (AC balance). At a potential other than zero, the fiber will oscillate in the ac field with frequencies equal to, and double the applied ac frequency. The oscillations of the fiber, viewed in a microscope, provide the means of detecting the small dc signals. The unique feature of the instrument is that a drift in contact potential can be determined and a measurement corrected for it, and that drifts of all other origins do not affect the accuracy of measurement. Excessively large input signals (up to several hundred volts) do not damage or paralyze the instrument. It has zero warm up time, is rugged, readily portable, nongeotropic, and is easy to operate. Sensitivities of 10^4 divisions per volt or 5×10^{15} divisions per coulomb with good control are possible when using an ac line supply regulated with a saturation transformer.

ISIDOR LERNER
Recording Secretary

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